

# Gravity sand filters

autonomous and valveless

## **AGF**

The simplest automatic sand filter





## The challenge

The removal of contaminants from water systems to provide clean water is critical for a number of purposes including:

- cooling systems
- drinking water
- final effluents
- process and plant supply

Are you unhappy with traditional methods of sand filtration such as pressure and moving bed filters that have high levels of automation or require operator involvement and are often unreliable and difficult to manage? Is your maintenance on these a headache?

Do you require new or replacement sand filters?

## The solution

Clean up your systems with one of the simplest sand filters on the market capable of meeting this challenge - the Autonomous Gravity Sand Filter (AGF). Once installed the system has virtually no running costs. It is completely automatic and totally self-contained and operates with no instrumentation, backwash pumps or similar.

The backwash function of the AGF is self-initiated and only backwashes itself when necessary, using a pre-stored volume of already filtered water, on the loss of head principle and therefore, the backwash occurs precisely when it is needed at any time.

These filters are renowned for working for long periods without needing any operator attendance or maintenance whatsoever. Filtration in the AGF filter is also excellent since conservative ratings are used together with a uniform backwash rate and volume ensuring that the sand bed being backwashed is always maintained in optimum condition.





## How it works

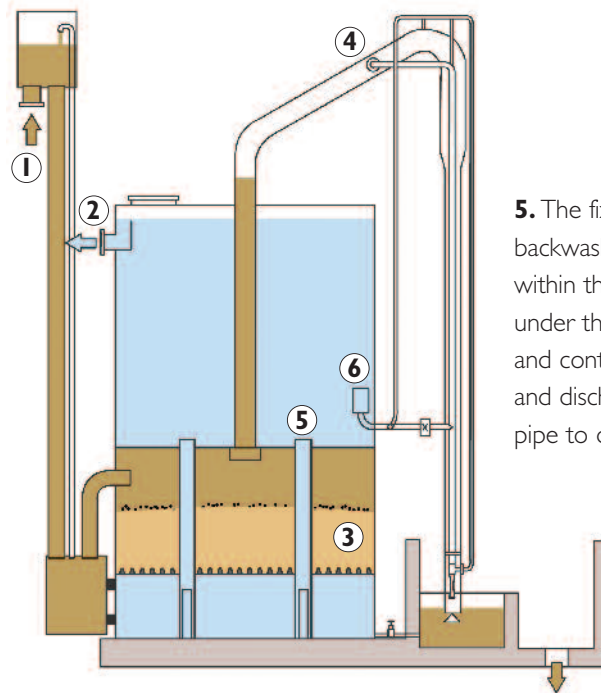
**1.** Contaminated water is introduced to the filter via a header tank from where it is fed into the central filtration compartment where contaminants are retained.

**2.** The filtered water then gravitates into the bottom filtrate collection compartment from where a series of pipes transfers it to the top backwash storage compartment with flow to service then commencing.

**3.** As contaminants accumulate in the sand-bed a pressure drop develops which causes a rise in the level of the column of water in the backwash pipe.

**4.** At the geometrically built-in maximum water level, a flow of water occurs through a simple evacuation system that initiates the backwash within a short period.

**5.** The fixed volume of filtered backwash water which is stored within the unit is passed back under the sand bed which expands and contaminants are removed and discharged via the backwash pipe to drain.



**6.** The backwash is subsequently terminated when the backwash storage compartment is depleted. On completion of backwashing the filter reverts to filtering mode, re-fills itself and flow to service is once again established.

The above describes a single bed filter in operation. Double bed units are also available where twice the flow can be achieved through the same footprint.

To see an interactive demonstration of how AGF works

visit: [www.superior-filtration.com](http://www.superior-filtration.com)

# Applications

- Iron and manganese removal
- Make-up water for cooling systems
- Plant supply water
- Potable water
- Side-stream filtration of sea and ground water cooling systems
- Tertiary treatment and final effluent filtration
- ...and many others

# Industries

- Automotive
- Brewing
- Brine processing
- Chemical
- Food
- Minerals
- Mining
- Municipal final effluent
- Municipal water
- Oil & gas
- Petrochemical
- Pharmaceuticals
- Plastics
- Power generation
- Refining
- Rubber
- Steel
- Tyres
- ...and many others

## CASE STUDY 1

### Application

Side-Stream Filtration of re-circulating ground water cooling system

### Location

Power Station, South Africa

### Operating data

1 x 4.2m diameter, single bed, maximum flow 140m<sup>3</sup>/hr



## CASE STUDY 2

### Application

Bore-Hole water, iron, manganese and solids removal for drinking purposes

### Location

Municipal Water Treatment Works, UK

### Operating data

2 x 7.5m diameter, single bed, maximum combined flow 890m<sup>3</sup>/hr



## CASE STUDY 3

### Application

River water solids removal for process requirements

### Location

Gold mine, West Africa

### Operating data

2 x 3.0m diameter, single bed, maximum combined flow 140m<sup>3</sup>/hr



## CASE STUDY 4

### Application

Final Municipal Effluent solids removal to meet consent levels before discharge to river

### Location

Municipal Waste Water (Sewage) Treatment Works, UK

### Operating data

3 x 4.5m diameter, single bed, maximum combined flow 480m<sup>3</sup>/hr



## Features and Benefits

### Construction and installation

- Supplied in a wide range of diameters
- Optimised design parameters
- Straightforward installation
- Double bed version available
- Covers a wide range of flow rates
- Constant efficient operation
- Configuration as per customer requirements
- Twice the flow for the same footprint
- More manageable backwash
- More cost efficient

### Operation

- Extremely simple operation
- Autonomous mechanical operation
- Automatic backwash only when necessary on loss of head principle
- No backwash pumps or automatic valves needed for operation
- No pressurised water required
- Minimal running costs and operator involvement
- Larger flow rates through a single unit compared to other designs
- For standard applications no air required for backwashing
- Fit and forget filters
- Ideal for use in zoned hazardous areas
- No electrical requirements for operation
- Human error eliminated as filters can not backwash too early or too late, too fast or too slow
- Stores own reservoir of backwash water for backwashing purposes when required
- Either gravity flow or low lift pumps to get feed to inlet tank
- Lifetime costs lower than other systems
- Less units required
- Manual or automatic air scour facility can be built in when required, e.g. final effluents

### Maintenance

- Minimum wear and tear, reduced maintenance
- Less manpower required

● FEATURES ● BENEFITS ●



## Technical Data

|                                 |  |
|---------------------------------|--|
| ● Areas of application          | Filtration of water, final effluents and process liquids   |
| ● Flow rates - Single Bed Units | Up to 1130m <sup>3</sup> /hr   |
| Double Bed Units                | Up to 2260m <sup>3</sup> /hr   |
|                                 | Unlimited in multiple units  |
| ● Nominal line sizes            | 50 to 800 mm   |
| ● Flange connections            | As per requirement   |
| ● Filtering levels              | Influent max. $\pm$ 50 mg/l  |
| ● Operating pressures           | Atmospheric  |
| ● Temperature -At sea level     | Up to 70°C   |
| At 3000m                        | Up to 30°C   |
| Intermediate                    | Between above  |
| ● Materials of construction     | Carbon steel, Stainless Steel  |
| ● Manufacturing                 | Sound engineering practice   |
| ● Corrosion protection          | Painting as per requirement  |
| ● Filter medium                 | Sand, Anthracite and others as per application   |
| ● Backwashing medium            | Filtrate   |
| ● Controls                      | For standard cooling, drinking and process applications - none. Where biological containments are present, for example in final effluents, manual or fully automatic air-scouring available. |

Technical details above are typical.

### Automatic backwashing / No hassles / Low maintenance - Sound interesting?

If you are looking for filters with a difference that give all of the above and more, together with proven track records, backed up by solid references and many years of product history - then for all your filtration and purification needs, contact the specialists

**Superior Filtration Limited**  
**31A Cleveland Road, South Woodford,**  
**London, E18 2AE, UK**  
**Tel: +44 20 8989 1171**  
**Fax: +44 20 8530 1150**  
**Email: [sales@superior-filtration.com](mailto:sales@superior-filtration.com)**  
**[www.superior-filtration.com](http://www.superior-filtration.com)**

